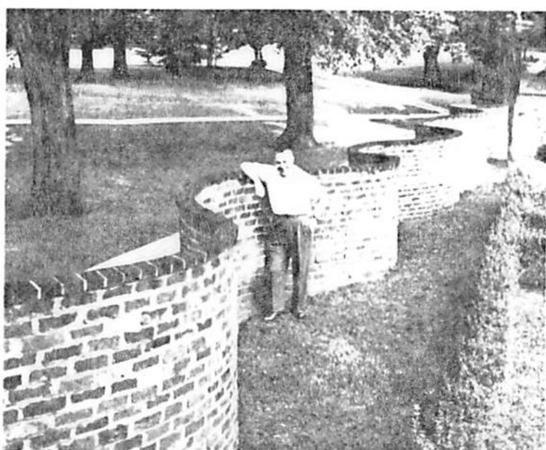
BRICK is usually made from clay or shale. It is a construction material that has been hardened into the shape of a block. Some brick is made of concrete, or of a mixture of sand and hydrated lime. Such brick is used in building walls.

Good building bricks are uniform in color and size, and have a pleasing appearance. They are free from cracks and irregularities. Well-made bricks produce a metallic ring when struck with a hammer. They have enough strength to resist crushing and bending, and absorb little water. They resist the action of fire and frost. Good bricks also *bond* (unite) well with *mortar*, the material used to join bricks in building.

How Bricks Are Made

Forming the Bricks. After clay for bricks has been dug, it is crushed. Manufacturers then grind the clay thoroughly in a rotating pan with heavy rollers. This machine is called a *dry pan*. The clay is then screened to remove the coarse material. Water is added to the clay, and revolving knives chop and mix the clay into a plastic mass. This mass is molded into bricks by (1) the stiff-mud, (2) the soft-mud, or (3) the dry-press process. The important difference in these methods is the amount of water used. After the bricks are formed, they are dried and then *fired* (burned).



Ewing Galloway

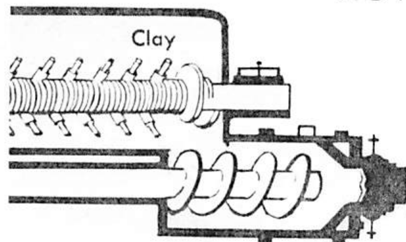
Bricks have been used for building since before the time of the ancient Egyptians. This fence, a fine example of the bricklayer's art, was designed by Thomas Jefferson. It stands on the University of Virginia campus and is called the *Serpentine Wall.*

A mobile brick factory has been invented. The brickmaking machine is mounted on a truck, and is operated by the truck's engine. The apparatus scrapes clay from the ground, mixes it, and forms it. The machine smooths the ground as it goes along, and the bricks are stacked there to dry in the sun.

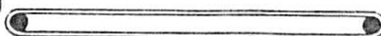
Stiff-Mud Process is used to make most building bricks. Water is added to the clay to make it a stiff mud. The brickmaking machine forces the clay through an opening to form a long ribbon. The ribbon of clay is cut into brick sizes by a *brick cutter*, an apparatus with evenly spaced wires that slice through the stiff

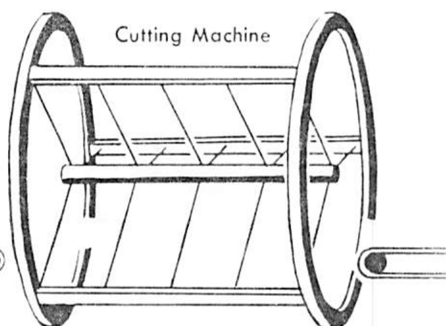
See World
book
on
Brick
Kilns

HOW BRICKS ARE MADE



Brickmaking Machines grind and mix stiff clay and force it through an opening onto a conveyer belt. A cutting machine cuts the bricks to size. The raw bricks are dried and stacked in a kiln where they are baked.





clay. Sometimes air is removed from the clay by attaching a vacuum pump to the brickmaking machine. Removing air makes the clay stronger and easier to handle.

Soft-Mud Process is used for all handmade brick. Molds are dipped in sand or water to prevent the clay from sticking. Water and clay are mixed to make a soft paste, which is pressed into the molds.

Dry-Press Process. Almost perfect *face* brick, the brick used on exposed walls, is obtained by this method. Only enough water is added to the clay to make it damp. The clay is then pressed into molds.

Drying. After the bricks have been formed, they are stacked in drying rooms. Air heated to temperatures from 100° to 300° F. (38° to 150° C) circulates through the drying rooms. The heated air removes much of the water. The bricks are dried slowly to prevent extensive shrinking and cracking. Drying may take from one day to six weeks, depending on the amount of water in the clay.

Burning or Firing. When the bricks are dry, they are stacked in ovens called *kilns,* which are heated by burning coal, oil, or gas. The temperature in the kiln is increased slowly until it reaches 1600° to 2000° F. (871° to 1100° C) or higher, depending on the kind of clay used. The clay particles become partly melted and fuse together, making the brick hard and strong.

Vitrified bricks are so well burned that they will not absorb water when they are soaked. *Medium-burned bricks* absorb some water, and *soft-burned bricks* absorb much water. Clays that are high in iron compounds make red brick. Clays with a low iron content are used for yellow or cream-colored brick. Variations in color can be obtained with some clays by *flashing* the brick at the end of the burning. In flashing, the fires are made very smoky to make the iron in the clay darker.

Kilns for burning bricks are either the periodic or continuous type. *Periodic kilns* are usually round and have a domed top. They are filled, fired, and then emptied. The simplest kind of periodic kiln is made by stacking the unburned bricks to form rows of arched holes or tunnels. The fires, built in the holes or tunnels, pass upward through the bricks. The outside wall is sealed by plastering it with mud.

Continuous kilns may be of the chamber or car-tunnel types. The *chamber kiln* is formed by a number of periodic kilns placed in line. There is a single firebox located outside the kilns, and flues conduct the heat to the individual chambers. Heat for any individual chamber can be turned on or off at will. Thus, it is possible to have many stages of firing and cooling going on at the same time in different chambers. The *car-tunnel kiln* consists of a long tunnel divided into three chambers, one for preheating, one for firing, and one for cooling. The bricks are placed on cars that are pushed through the tunnel, stopping in each chamber. Thus, the bricks are gradually heated and cooled as they move through the tunnel.

Kinds of Brick

Styles. Clay and shale bricks of various colors are produced for use as *face brick,* to be used on the exposed face of a wall. *Common brick* (*backing brick*) is used mainly for the backs of walls. *Firebrick* (*refractory brick*) is used to line furnaces and kilns because it withstands high temperatures.

Face bricks may be smooth or their exposed areas may be roughened by *wire cutting* (scratching), as in *tapestry brick.* Manufacturers make smooth-faced *glazed bricks* that are glazed by being exposed to gases produced by throwing salt into the fires of the kiln. *Enameled bricks* are made by coating the surface of smooth, unburned clay brick with a material that melts to a glass when the bricks are fired. Enameled bricks have a smoother surface than salt-glazed bricks and

BRICKLAYING

Bricks are laid in horizontal layers called *courses.* A mason's line is used to make sure the courses are straight. Bricklayers use a trowel to apply mortar between the bricks to hold them together and make the wall watertight. They arrange the bricks in designs, called *bonds,* for strength.

